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ABSTRACT

The evolution of technical education in Argentina has not been so much a process of vocationalization of academic education as a process of secundarization of vocational education. Argentine technical schools are the product of a process of convergence among terminal trade schools, vocational schools, and industrial technological schools that has resulted in an educational system with a dual purpose (to foster mobility toward higher education and to teach vocational skills) and a nonintegrated curriculum. Brazil, on the other hand, has traditionally had a selective academic secondary education accompanied by a less prestigious vocational branch, with the latter accounting for half the secondary school enrollment in 1971. In 1971 it was decided to vocationalize the entire second cycle of secondary education throughout Brazil. An amendment was subsequently introduced that allowed special preparatory studies for bright students. The attempted reform was not entirely successful because some schools cheated by retaining old curricula under new names, other schools lacked the resources to implement first-rate programs, and yet other schools offered certifications that discriminated between two kinds of qualifications in order to avoid granting professional degrees to incompetent graduates. The problem in both countries appears to be how to attain a mix of general education, preparatory studies, and vocational education in secondary education in a way that would permit a significant proportion of graduates to continue on to higher education but at the same time would furnish most of them with the skills necessary to compete in the labor market. (MN)

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THE SECONDARIZATION OF TECHNICAL EDUCATION IN ARGENTINA

and

THE PROFESSIONALIZATION OF SECONDARY EDUCATION IN BRAZIL
IN A COMPARATIVE PERSPECTIVE

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THE SECONDARIZATION OF TECHNICAL EDUCATION IN ARGENTINA
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THE PROFESSIONALIZATION OF SECONDARY EDUCATION IN BRAZIL
IN A COMPARATIVE PERSPECTIVE

Marfa Antonia Gallart
CENEP
Argentina, 1986

This paper presents a particular point of view on the problem of vocationalizing secondary education. It draws on the considerable experience of Argentina in secondary technical education, from its early creation at the end of the nineteenth century up to its present status as a branch of secondary education which includes more than a fifth of total secondary school enrollment, and more than a third of male enrollment.

There occurred a paradox in the history of Argentine education. The attempt at vocationalizing academic education failed, but the technical branch grew, integrating general education into its original curriculum of predominantly technological subjects and stressing a double purpose of both preparing its graduates to enter the university and teaching them skills for the world of work.

Examining these failed reforms¹, one can see that two goals underlie the attempts at vocationalizing post-primary education. The first is to teach skills which would permit the secondary school graduate to compete advantageously in the labor market. The second is to diminish the pressure on higher educational institutions by making vocational education terminal. There are several problems with this approach. One is the presence of very strong demand for access to the upper levels of the educational system in Latin America. A second is the difficulty in integrating general preparatory and vocational education in one and the same curriculum when a dual-purpose secondary school is chosen. The third is the projection of the skill profile that will prevail in the labor market in the future. And last but not least, that the supply of educational variants coincides with the actual social demand, in order

¹Since the creation of a national educational system in Argentina a century ago, with a French style predominantly academic secondary level, several reforms have been introduced. Two large reforms (in 1916 and 1969) were put into effect but soon had to be aborted because of political opposition. In both cases the reforms implied vocationalization and the specialization of post-primary education. See Marfa Antonia Gallart, The Evolution of Secondary Education in Argentina, Ph. D. Dissertation, University of Chicago, 1983, Chapter II.

to avoid the "vocational school fallacy of educational planning."¹

The evolution of technical education in Argentina, along with its present curriculum and outcomes, illustrate some of these problems. Even though they are a school-based branch of secondary education, Argentine technical schools are the product of a process of convergence between terminal trade schools, vocational schools and industrial technological schools which nowadays takes the form of a technological branch of secondary education. Most of its graduates continue to both study and work. The evolution of technical education in Argentina was not so much a process of vocationalization of academic education as a process of secundarization of vocational education. Nevertheless, the forces at work are the same as those that act when vocationalization of academic secondary education is introduced, i.e., strong social demand for secondary education linked to mobility aspirations; competition among social sectors for access to the upper levels of the educational ladder with the consequent segmentation between tracks, schools, and/or optional courses; the influence of the characteristics of the labor market on the social demand for the different tracks; and in the positions open to school leavers, given the labor market's segmentation, the devaluation of credentials, and changes in salary differentials. These elements enter into the process and weigh on the success or failure of vocationalization. The point is that the analysis of the evolution of Argentine technical education in comparison to the vocationalization of secondary education in Brazil may give us some clues leading to a more realistic implementation of vocationalization policies.

¹See the classic paper on the relationship between students' preference for academic studies and the advantages in the labor market of these academic diplomas for white collar and upper level occupations Philip J. Foster, "The Vocational School Fallacy in Development Planning," in J. Karabel and A. H. Halsey, eds., Power and Ideology in Education. New York: Oxford University Press, 1977, pp. 356-65.

The Evolution of Argentine Technical Education

The original development of elementary education in Argentina, which made elementary education available to half of the 6-13 age group as early as 1914, also sustained the development of secondary education (in 1915 the level included approximately 3 percent of the 13-18 age group and was predominantly academic). At that time, industrial education, i.e., the secondary technical branch of it, begun in 1899 as technological postprimary schools whose goal was the training of middle-level technicians, accounted for only 5.4 percent of secondary enrollment, while commercial schools had 10.9 percent. Terminal vocational trade schools were created in 1909 to feed the newborn industrial sector. By the mid-1940s they accounted for approximately 5,000 students, almost a fifth the size of the enrollment in the non-terminal industrial schools. Trade schools lost their clientele during the first Peronist government (1946-1951) when the Ministry of Labor created the CNAOP¹ system which were vocational schools that permitted the student to pursue higher studies in a particular technical institution, then called the Worker's University. At the time these schools contained just as many students as the Industrial schools run from the Ministry of Education. In the early 1960s all of these various vocational branches of postprimary education were unified under an autonomous office of the Ministry of Education. Thus the present technical system was born. These schools are non-terminal, providing degrees to middle level technicians in a number (25) of fields. But their enrollment is concentrated in only a few fields: electricity, construction, mechanics, and chemistry. In 1985 the total secondary enrollment rate was around 60 percent, with a majority of students in the commercial and technical areas of the vocational non-terminal branches.

¹Comisión Nacional de Aprendizaje y Orientación Profesional, i.e., the National Commission for Apprenticeship and Professional Guidance.

Characteristics of Technical Schools

While they stress mathematics and sciences over the humanities, these schools have a mixed curriculum which begins with three years of academic subjects common to all fields of specialization, in addition to shopwork. These three years are equivalent to the basic course cycle in the other branches of secondary education, and consequently students can change tracks. The final three years are distinct for each field of specialization. They include a strong mathematics curriculum (including calculus), scientific and technological subjects, technical drawing, laboratory and shopwork. This curriculum extends technical education a year longer than the other tracks of secondary education, and furthermore is fulltime (Commercial and Baccalaureate Schools are only half day schools). Even given these extra requirements one out of three boys enrolled in secondary education was in a technical school in 1985.

Does this curriculum meet the expectations resulting from the dual purposes of preparing the student for both technical work and a university career? In a recent in-depth study of technical schools¹, the articulation among the humanities, scientific and technological subjects, and the integration of shopwork with classroom subjects was analyzed, taking into account the double purpose of technical education. This study examined technologically very different fields of specialization: electronics, construction and mechanics. With regards the integration of the curriculum, in all schools analyzed a gap developed between the technical subjects and the general education subjects, and also between classroom and shop. Different teachers, and even different spaces (classroom, laboratory, shops) signalled "islands" which supported divergent poles of technical education. General education did not prepare the student to think critically about the scientific-technical culture but was rather

¹This was a "thick description" study of fifteen schools. The researchers spent a month in each, interviewing principals, teachers and students, and observing classrooms and shops. See Marfa Antonia Gallart, La Racionalidad Educativa y la Racionalidad Productiva: Las Escuelas Técnicas y el Mundo del Trabajo. Buenos Aires: CENEP, 1985.

only a bad copy of the humanities as taught in the encyclopedic academic schools. Technological and scientific subjects were both too many and too broad, and their material was impossible to cover as scheduled. As a consequence teacher's strategy was to choose what they considered key topics necessary either for work or higher education, and within each subject they stressed the things that were required in order to understand the focal concepts. This policy broke the horizontal coordination of the curriculum, and at times it became more a presentation of technical recipes than a real knowledge of science and technology. Shop and laboratory suffered from a double challenge. The first derived from the uniformity of design forced upon different fields of specialization. The curricular links between scientific subjects, technological subjects, and shopwork (including questions of timetable and location) were borrowed from a metalworking model (where it is easy to interlink, e.g., physics, thermodynamics, study of machinery, materials analysis, shopwork with machine tools, etc.). Such an educational model for instance is greatly different from the model that would have to be applied in, e.g., training in electronics, where the relationship between the laboratory and theory is much more profound and dynamic. The understanding of symbology is much more developed (and required) in the manipulation of electronic circuitry. As a consequence the articulation of the subject matter with the laboratory and shopwork is much more complex and simply cannot function in separately compartmentalized educational programs.

The second challenge dealt with the difference between teaching science and technology for future engineering students and the apprenticeship of a technician in a situation similar to the world of work. Some shops made an effort to work like a production unit. Several even produced goods. But the reproduction of this "like work" world is very difficult in the context of a scholastic organization. The values and rationale behind learning to climb the educational ladder are very different from the effort to earn and preserve a place in an enterprise. In school the demands of production and commercial competition are absent. Productive work degenerates into "make believe," defended by the belief that the student only needs to "learn to do so that he

can command," as some students and teachers put it¹. Given this pedagogic point of view, the student is not required to become a good lathe operator.

Are these problems insurmountable? Is it possible to provide general education and at the same time train a middle level technician in an integrated way? A recent essay by Moura Castro on vocational education puts forward some interesting ideas in this regard.² The author examines different occupations and locates them within a two-dimensional typology. The first is the continuum between tasks which follow strictly simple rules as, for example, in semi-skilled jobs and those that follow complex rules as in technical occupations. The second dimension deals with occupations that manage simple decision-making tasks as, for example, in lower administrative positions, or else are required to deal with many exceptional situations, and thus accept responsibilities and take risks as in managerial jobs. In the continuum between the extremes of the typology, technical training which stresses the mechanical learning of rules and their applications is useful for the first type of occupations, but as one advances toward the other end some kind of training which prepares the student to respond to the challenges of uncertainty is necessary. The author calls this latter general education. General education, then, is not academic encyclopedism, but rather what was the original purpose for teaching and learning the humanities, that is, a strong paradigm which enabled the individual to think and to solve problems. In other words general education is not an all-embracing education, but rather an education which teaches a way to think. The author posits a scientific technological education which runs from the analysis of the machine to physics, from applied electronics to Boolean algebra. General education is not a matter of width but of depth. Moura Castro asks whether specific education is not the best general education. To apply this criterion to Argentine Technical Education could be one way to

¹Some of these dangers of technical school curricula are presented in a broader context in Kenneth King, The Planning of Technical and Vocational Educational and Training. Paris: UNESCO-IIIIEP, 1985.

²Claudio de Moura Castro, Educación Vocacional y Productividad: Alguna luz en la Caja Negra? Brasilia: Instituto de Planejamento Econômico e Social, Centro Nacional de Recursos Humanos, 1984.

respond to the challenges presented here, by training the technician who can both manage a broad spectrum of occupations and master a method to think and study.

A second aspect of technical education worth examining is its outcome in terms of the performance of graduates. This issue can be broached using the results (currently in the analysis stage) of a follow-up study of 400 technical school leavers who finished school in 1973-74 and were interviewed in 1985.¹ Some preliminary results may be presented here. Although there is a considerable social mix, the surveyed alumni come mostly from lower middle class families. Most of them have reached a higher educational level than their parents (72 percent of the respondents' fathers had elementary education or less). And among the technicians surveyed 80 percent had entered the university, while 20 percent are higher education graduates (most of them in engineering and architecture). The historical period since their finishing school was a very critical time for the Argentine economy. Inflation continued and increased. Industrial employment decreased. And since 1981 open unemployment --very low before-- grew. Nevertheless, the follow-up study showed a high level of employment (97.7 percent), more than the Metropolitan average for that date.

Technical school leavers occupied a variety of occupations.² Around 40 percent were technicians or professionals. But there were also entrepreneurs (approximately 10 percent), self-employed in small enterprises (20 percent), executives (6 percent), and skilled workers (3 percent). Only a third worked in the manufacturing sector, but 42 percent worked in tasks related to their fields of educational specialization. And an additional 24 percent applied general technical knowledge to tasks not directly related to their particular

¹This study is part of the project "Education and Work: The Role of Technical Education in Argentina," presently in process in CENEP, Buenos Aires.

²A detailed description of the tasks performed by the respondent was compiled, and occupations were categorized along different continuums: knowledge and skills applied, occupational categories, and hierarchical status.

field of study. But only 26 percent were in occupations that had nothing to do with the training they had received. Regarding mobility, 55 percent had attained an occupational level higher than that of their parents (with only 20 percent lower than the parents). 72 percent owned one or more cars, and 51 percent owned their own home.

The Process of Secundarization of Technical Education

The forces at work in changing secondary education presented on page 2 can be seen now in the light of the evolution of technical education. The demand for non-terminal vocational education was always greater than the demand for terminal streams. Even when trade schools were demanded by workers' children as a first step into post-primary education, but these trade schools never accounted for more than 20 percent of industrial school enrollment. With the appearance of CNAOP schools enrollment in trade schools declined rapidly. In the 1960s attempts to make the technical branch terminal found strong opposition. Present technical education with its dual purpose and non-integrated curriculum is the result. How to better integrate general, preparatory and vocational education continues to be a problem, as we have seen above. But the performance of the technical school graduates in the world of work reveals a profile which is much wider than the one defined by the authorities of technical education (which is that of providing strictly middle level technicians specialized in a particular field), but a profile which has a good chance of competing in the labor market. The amount of recorded intergenerational mobility reveals some of the reasons for the demand for that type of education by low middle class and workers' children.

Concerning the forces at work, resistance to the vocationalization of academic curricula and to the specialization of preparatory courses over a long period points up the desire to keep all the tracks oriented towards possible entrance into the university and to maintenance of the general education character of the academic branch. If these trends are related to enrollment

patterns, it appears that actually the main function of secondary schools --to foster mobility toward higher education-- had tacked on to it the vocational function of teaching skills (within commercial and technical schools at least), so that students of lesser economic means could more advantageously enter the labor force. This dual purpose was aided by the fact that Argentine universities allow students to work, accomodating schedules to that end. The vocational objective is therefore not incompatible with the preparatory goal in terms of a student's plans.¹

Regarding the competition among social sectors for access to the upper levels of the educational system, the few studies which take into account the social background of Argentine secondary students show a high participation rate for students from the lower middle class (and obviously from the upper strata), while the children of blue collar workers have low levels of participation in the last years of secondary education. There exists a great deal of educational mobility, particularly among the children of parents who have completed elementary school, while at the university level the children of highly educated parents are overrepresented.²

Most students expect to enter higher education, even admitting in many cases the need to combine study with work. The hierarchizing among the choice of studying only, working and studying, or working only is closely correlated with socio-economic status and chosen branch of secondary education (which two variables are interrelated, technical and commercial schools having a larger probability of receiving lower class students).

Thus it seems that seeking educational mobility (and ultimately occupational mobility) appears for many lower class students to be a possible objective, while for upper class students higher education and exclusive private

¹Marfa Antonia Gallart, The Evolution, p. 136.

²Marfa Echart de Bianchi, Los Determinantes de la Educación en la Argentina. Buenos Aires: FIEL, 1976. Doris Klubitschko, El Origen Social de los Estudiantes de la Universidad de Buenos Aires. Buenos Aires: UNESCO-CEPAL/PNUD, 1980.

schools are a way to maintain the status attained by their parents.¹

The Brazilian Case

Brazil traditionally has had a selective academic secondary education, accompanied by a less prestigious vocational branch,² the latter covering half of secondary enrollment in 1971. This vocational stream included different schools for agricultural, commercial and industrial tracks.³ The vocational tracks were aimed at the lower classes,⁴ though since 1953 their graduates have had access to the university, although they had to take special equivalence examinations, until in 1961 they were given the same rights as students in other tracks to continue higher studies.

The Reform

In 1971 the government decided to vocationalize the entire second cycle of secondary education across the whole country. The first cycle was integrated with primary education in a basic elementary cycle of 8 years with a general education focus. The second cycle (second grade) was to be taught in all schools and was to be mainly vocational. The debate on the reform

¹Marfa Antonia Gallart, The Evolution, p. 213.

²In 1909 trade schools were founded in state capitals for apprenticeship courses for poor children. Only in 1942 was secondary technical education institutionalized with the "Lei Orgânica do Ensino Industrial." See Maria Laura P. B. Franco, "O Ensino de 2º grau: Democratização? Profissionalização? ou nem Uma coisa nem outra?" Cadernos de Pesquisa, São Paulo (47): 18-31, Nov. 1983, p. 21; and Marina Ribeiro Leite and Rita de Cassia Barros Savi, "Ensino de 2º grau profissionalizante," Cadernos de Pesquisa, São Paulo (36): 3-25, Feb. 1980, p. 3.

³Nelson Piletti, La Profesionalización Obligatoria de la Enseñanza de Segundo Grado en Brasil, Montevideo: OIT-CINTERFOR, 1984, Capítulo 1.

⁴Constitución of 1937, Art. 129.

revealed the importance attributed to vocational education during the second cycle in order to prepare the student for work, by granting professional qualifications. Nevertheless, an amendment was introduced, allowing as an exception, special preparatory studies for bright students. The idea behind the law was to train middle level human resources for the labor force and dissuade the student from the pursuit of university studies.¹

The Process

The reform was difficult to implement even in the richest state, Sao Paulo. Some schools retained their old curricula by cheating. Under the cover of new names they kept the old subjects. Others chose "easy" vocational fields without taking into account labor market requirements in order to allow the students to concentrate their study for university entrance examinations. Many vocational courses were aimed at the tertiary economic (70 percent), and only 20 percent at the secondary economic sector. Some schools did not have the means to even implement vocational courses, and these were second rate.² The certifications discriminated between two kinds of qualifications in order to avoid the pitfall of granting professional degrees to incompetent graduates: a basic qualification which was only a professional initiation to be complemented by learning on the job, and a full certificate.³ Courses leading to this latter accounted for approximately a third of second cycle enrollment in Sao Paulo in 1977.⁴

The contradiction between the intended purposes of the reform and the resultant disorganization of the second cycle, the funding problems (costs were 60 percent higher than those for academic courses),⁵ affected the decision to

¹Law 5692/71.

²Nelson Piletti, La Profesionalización, p. 111.

³Ibid., p. 115.

⁴Maria Ribeiro Leite, "Ensino de 2º grau," p. 11.

⁵Ibid., p. 5.

change the law in 1982. The new law¹ replaced the old "qualification for work" with a new "preparation for work" as part of the "integral education of the student." Moreover, compulsory vocationalization aimed at producing qualified professionals was made optional for schools.²

Enrollment in second cycle schools grew during these years. In 1976 there were 345,842 students in the state schools of Sao Paulo. By 1980 there were 416,216.³ In 1982 35 percent of the 15-18 age group of the city of Sao Paulo was in second cycle schools, allowing for wide differences among districts. In one blue collar district there was only an 11.25 percent enrollment rate. In a study of second cycle students in Sao Paulo only 45 percent of them thought to take higher education entrance examinations. Others prefer to work for a while to save money for higher education. Most think their schooling did not prepare them sufficiently to compete in those examinations. A majority also think that they are not qualified to work as technicians, and as a consequence expect to follow some specialized training in SENAI.⁴

Some differences between Argentine and Brazilian education must be stressed. There is a smaller coverage of formal education in Brazil --34 percent of school age children had never been in school when the law of vocationalization of the second cycle was introduced.⁵ The enrollment growth in both cycles is a recent phenomenon compared with Argentina (Tables 2 and 3). However, non-formal education, vocational and technical training for the industrial and service sectors had been developed early and with a significant

¹Law 7044.

²Mirian J. Warde, "Algunas Reflexoes em Torno da Lei 7044," Cadernos de Pesquisa, Sao Paulo (47): 14-17, Nov. 1983.

³Nelson Piletti, La Profesionalización, p. 116.

⁴Maria Laura P. B. Franco and Maria Ines S. Durigan, "O Aluno de Cursos Profissionalizantes a Nivel de 2º Grau: Un Retrato sem Retoques," Cadernos de Pesquisa, Sao Paulo (48): 47-56, Feb. 1984.

⁵Nelson Piletti, La Profesionalización, p. 35.

coverage in SENAI and SENAC.¹ In Argentina non-formal technical training was never important. In any given year there are more graduates of six year technical schools than short course trainees. The development of the industrial sector was also different. Instead of an early development, followed by stop-and-go cycles and stagnation as in the Argentine case, Brazil's development is more recent and has been stronger and sustained, at least until the present crisis.

Conclusions

We can now turn to the problem of vocationalization of secondary education as presented at the beginning of this paper, drawing some conclusions from the experience of both countries. The demand for non-terminal secondary education in Latin America will continue to be very strong as long as the private rate of return of subsidized higher education is high. And the political costs of diminishing enrollment in non-terminal secondary education or higher education seem too great for democratic governments, and even for many authoritarian ones. As far as formal education is concerned, terminal courses meet very little demand. The problem then seems to be focused on how to attain a mix of general education, preparatory studies and vocational education in secondary education in a way that would permit a significant proportion of graduates to continue on to higher education, but at the same time would furnish most of them with the skills necessary to compete in the labor market. One must take into account that either because of attrition at the higher levels (as in the case of Argentina) or because they cannot pass entrance examinations, for a majority of students their secondary education will be their last completed educational cycle.

¹Ralph Edfelt, "Occupational Education and Training: The Role of Large Private Industry in Brazil," in Educational Alternatives in Latin America, ed. T. LaBelle, Los Angeles: UCLA, 1975, pp. 384-413.

There are several possible responses to this problem. One is to provide a strong polytechnical branch of secondary education which would give the student a basic training to perform as a middle level technician or to continue studying for a technical career. Another possibility is a comprehensive school with the option of training courses for specific occupations. The Argentine way seems to be closer to the first option, while the Brazilian case is nearer the second. But the latter seems to be difficult to implement in a country with a very strong non-formal professional training (as the history of SENAI and SENAC shows) and with a tradition of predominantly academic formal secondary education, which at the same time reaches only a minority of the target age group even in urban settings. Indeed, perhaps the articulation between in-school general education and post-school non-formal technical training is a better answer for Brazil.

A second issue concerns the way to introduce reforms that would vocationalize secondary education. The examples from the past history of Argentina and the recent experience of Brazil show that it is very difficult to change an entire level of the educational system by decree. There are a number of factors that must be taken into account. A few are listed below:

a) It is necessary that the reform channel the demands of parents and students. In other words, individual choice, processed through the social demand for the different options, should be taken into account.

b) It is important that the protagonists of the educational system, especially parents, teachers and officials in schools and Ministries, accept and participate in the reform.

c) Vocational education is more costly than traditional academic education. Laboratories and shops, if they are really to be useful, are more expensive than blackboard and chalk. One of the constant critiques of Brazilian authors concerning the failed reform is that the funds to finance vocational education in all schools were not available.

d) The characteristics of the educational system as a nation-wide bureaucratic organization, divided into thousands of semi-autonomous units (i.e., the schools) make the process of change slow and difficult, not only in the

case of reforms, but also in the adaptation to changes in the labor market.

e) Educational expansion is related to changes in the labor market but has a different rationale and a different timing, depending on the kind of society one is treating (e.g., Argentina versus Brazil). The fitting of education to the productive system is an elusive aim.

f) Both processes, the vocationalization of academic education and the secundarization of technical education, cannot be understood without taking into account the aspirations of new strata reaching secondary education, the possibility of their continuing on to higher education, the prospects of vocational education for them as compared with the other options available in secondary education, and the changing opportunities within the labor market for graduates from the different levels and tracks of the educational system. As long as the educational system in developing countries does not cover the entire age group, the mechanisms of segmentation by tracks will have a different meaning than in developed countries. Wastage in elementary, secondary and tertiary levels is the hidden mechanism of differentiation for the lower social sectors of society.

One final important comment about the difference of learning a cultural heritage in successive steps, of acquiring a capacity for problem solving, or even of acquiring practical skills at an early age in a formal educational system, and the experience of learning to work in a competitive context with controls on one's efficiency, a particular division of labor, conflict and accumulation, and all this through life. This contrasting experience, as seen in the life histories of technicians, implies a different rationality for schools and enterprises, and is one of the reasons for the contradictory relationship between school and work. But it is also one of the reasons that makes this link so difficult to elucidate, yet so crucial for individuals and society.

TABLE 1

LATIN AMERICA: SECONDARY EDUCATION CRUDE ENROLMENT RATES BY COUNTRY, 1950-1975

	1950 ¹	1960	1970	1975 ²
Less than 15%	Honduras (1,9) El Salvador (3,3) Guatemala (3,5) México (4,0) Rep.Dominicana (4,7) Colombia (4,8) Nicaragua (5,0) Costa Rica (5,0) Paraguay (6,1) Ecuador (6,1) Bolivia (6,2) Cuba (6,4) Brazil (6,5) Perú (7,1) Venezuela (7,5) Chile (13,2) Uruguay (13,3)	Brazil (4,3) Guatemala (4,8) Nicaragua (5,3) Honduras (5,4) Rep.Dominicana (5,6) México (7,9) Paraguay (8,4) El Salvador (9,5) Bolivia (10,7) Colombia (10,8) Ecuador (10,9) Cuba (12,4) Perú (13,8)	Rep.Dominicana (8,9) Guatemala (9,1) Honduras (10,2) Brazil (11,3) Bolivia (14,3) Paraguay (14,9)	Rep. Dominicana (9,0) El Salvador (10,0) Honduras (11,1) Guatemala (11,5)

TABLE 1 (Cont.)

15% to 35%	Argentina (15,2)	Venezuela (17,7)	Nicaragua (15,9)	Brazil (16,9)
	Panamá (16,3)	Costa Rica (20,3)	El Salvador (16,3)	Bolivia (17,7)
		Chile (20,9)	México (20,2)	Nicaragua (19,0)
		Argentina (23,3)	Colombia (21,8)	Paraguay (23,0)
		Panamá (25,0)	Costa Rica (21,8)	Venezuela (30,1)
		Uruguay (30,1)	Cuba (22,1)	Chile (31,1)
			Chile (22,4)	
			Ecuador (23,8)	
			Perú (26,9)	
			Venezuela (27,7)	
			Argentina (32,3)	
35% to 50%			Panamá (36,2)	Costa Rica (35,2)
				Ecuador (35,8)
				México (37,4)
				Colombia (39,4)
				Perú (40,3)
				Argentina (41,1)
More than 50%			Uruguay (51,5)	Panamá (52,9)
				Uruguay (53,7)
				Cuba (58,3)

Source: UNESCO/CEPAL/PNUD, DEALC, Informe final 4, Vol. 2, Cuadro IV.28.

¹There is no information for Uruguay and Costa Rica.

²1974: Brazil, Nicaragua, Venezuela.

1975: Ecuador, Honduras, República Dominicana, Uruguay.

1976: Bolivia, Cuba.

1977: Argentina, Colombia, Costa Rica, El Salvador, Guatemala, México, Panamá, Paraguay, Perú

1978: Chile.

TABLE 2

ARGENTINA: SECONDARY EDUCATION ENROLMENT BY TRACKS, 1915-1985
(in thousands)

	Baccalaureate	Normal	Commercial	Industrial	Others (trade schools agricult.)	TOTAL
1915	11.1 (33.5)	10.6 (32.0)	3.6 (10.9)	1.8 (5.4)	6.0 (18.1)	33.7 (100)
1925	22.3 (36.6)	17.5 (28.7)	6.5 (10.7)	3.8 (6.2)	10.9 (17.8)	61.0 (100)
1935	41.0 (39.1)	24.4 (23.3)	11.0 (10.5)	9.2 (8.8)	19.3 (18.4)	104.9 (100)
1945	62.3 (31.0)	50.3 (25.0)	27.9 (13.9)	26.7 (13.3)	34.0 (16.9)	201.2 (100)
1955	110.7 (23.5)	97.3 (20.6)	83.3 (17.7)	86.4 (18.3)	94.2 (20.0)	471.9 (100)
1965	178.6 (22.6)	184.9 (23.4)	178.7 (22.6)	113.5 (14.4)	133.4 (16.9)	789.1 (100)
1975	454.2 (36.6)	- *	411.9 (33.1)	335.1** (27.0)	41.9 (3.3)	1243.1 (100)
1985	715.5 (42.5)	-	564.8 (33.5)	367.0 (21.7)	36.2 (2.2)	1683.5 (100)

Source: Ministry of Education, Dept. of Statistics.

* Teacher training was transferred to higher education and normal schools became Baccalaureate schools.

** Women professional schools were transformed in Industrial schools.

TABLE 3

BRAZIL: EDUCATIONAL ENROLMENT IN FIRST AND SECOND CYCLES
 1963 - 1983
 (in millions)

	First cycle*	Second Cycle**
1963	10.62	0.37
1965	11.57	0.51
1967	13.38	0.69
1969	15.01	0.91
1971	17.07	1.12
1973	18.57	1.30
1975	19.55	1.94
1977	20.37	2.44
1979	22.02	2.66
1981	22.41	2.82
1983	24.55	2.94

Source: Anuario Estatístico do Brasil. Secretaria de Planejamento da Presidência da República. 1981, 1983 Data from the Ministry of Education.

* Years 1 through 8 of Formal Schooling.

** Years 9 through 11/12 of Formal Schooling.

TABLE 4

1980. NET ENROLMENT RATE OF THE 15-19 AGE GROUP BY
EDUCATIONAL LEVEL IN BRAZIL AND ARGENTINA

	Brazil	Argentina
Basic Education *	26.5	5.6
Secondary Education **	14.4	32.6
Higher Education	1.4	3.5
Net Enrolment Rate	42.3	41.7
Total Population 15-19 years	100	100
	(13, 277.662)	(2, 335.407)

Sources: Brazil. Anuario Estatfstico do Brazil. Secretaria de Planejamento da Presidencia da República. 1981 (Census Data). Argentina. Censo Nacional de Población y Vivienda 1980. Serie B. Caracterfsticas Generales. INDEC, 1982.

* Brazil: Years 1 through 8 of Formal Schooling.
Argentina: Years 1 through 7 of Formal Schooling.

** Brazil: Years 9 through 11/12 of Formal Schooling.
Argentina: Years 8 through 12/13 of Formal Schooling.

TABLE 5

DISTRIBUTION OF TIME AMONG SUBJECTS IN SECOND CYCLE
BRAZILIAN PROFESSIONAL SCHOOLS (ELECTRONICS)
AND ARGENTINE TECHNICAL SCHOOLS

	BRAZIL *	ARGENTINA	
	(3 years)	Basic Cycle (3 years)	Superior Cycle (3 years)
Language National and English	17.5	14.2	3.7
Social Sciences	12.4	14.2	4.4
Mathematics and Sciences	18.6	26.8	
Technology and Shopwork	42.3	37.8	85.2
Physical Education	9.2	7.0	6.7
	100	100	100
TOTAL	(2910 hs.)	(4445 hs.)	(4725 hs.)

Sources: Brazil. N. Piletti, La Profesionalización, p. 80.
Argentina. Daniel Weinberg, La Enseñanza Técnica Industrial en la Argentina 1936-1965. Buenos Aires: Instituto Di Tella, 1967.

* Minimal Program for Electronics Technicians. Dictamen Nº 45/72. This is the special field with full professional qualifications with most time allotted to scientific and technological subjects.

REFERENCES

- Echart de Bianchi, Marfa. Los Determinantes de la Educación en Argentina. Buenos Aires: F.I.E.L., 1976.
- Edfelt, Ralph. "Occupational Education and Training: The Role of Large Private Industry in Brazil". In Educational Alternatives in Latin America. Edited by T. LaBelle. Los Angeles: UCLA, 1975.
- Foster, Philip J. "The Vocational School Fallacy in Educational Planning." in Power and Ideology in Education. Edited by J. Karabel and A. H. Halsey. New York: Oxford University Press, 1977.
- Franco, María Laura P. B. and Durigan, Maria Ines S. "O Aluno de Curso Profissionalizante a nível de 2º Grau: Un Retrato sem Retoques." Cadernos de Pesquisa (48): 47-56, Feb. 84.
- Franco, María Laura P. B. "O Ensino de 2º Grau: Democratizacao? Profissionalizacao? Ou nem uma Cosa nem Outra?" Cadernos de Pesquisa (47): 18-31, Nov. 1983.
- Gallart, Marfa Antonia. The Evolution of Secondary Education in Argentina. Ph. D. Dissertation, University of Chicago, 1983.
- Gallart, Marfa Antonia. La Racionalidad Educativa y la Racionalidad Productiva: Las Escuelas Técnicas y el Mundo del Trabajo. Buenos Aires: CENEP, 1985.
- King, Kenneth. The Planning of Technical and Vocational Education and Training. Paris: UNESCO-IIEP, 1985.
- Klubitscho, Doris. El Origen Social de los Estudiantes de la Universidad de Buenos Aires. Buenos Aires: UN-ECLA, 1980.
- Moura Castro, Claudio de. Educación Vocacional y Productividad: Alguna Luz en la Caja Negra? Brasília: Instituto de Planejamento Economico e Social - Centro Nacional de Recursos Humanos, 1984.
- Piletti, Nelson. La Profesionalización Obligatoria de la Enseñanza de Segundo Grado en Brasil. Montevideo: OIT-Cinterfor, 1984.
- Ribeiro Leite, Marina and Cassia Barros Savi, Rita de. "Ensino de 2º Grau Profissionalizante." Cadernos de Pesquisa (36): 3-25, Fev. 1980.
- Warde, Mirlam J. "Algumas Reflexoes en Torno de Ley 7044." Cadernos de Pesquisa (47): 14-17, Nov. 1983.
- Weinberg, Daniel. La Enseñanza Técnica Industrial en la Argentina 1936-1965. Buenos Aires: Instituto DI Tella, 1967.